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United States Patent [19]

Thompson

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[54] **ELECTRON TRANSPORTING AND LIGHT EMITTING LAYERS BASED ON ORGANIC FREE RADICALS**

[75] Inventor: **Mark E. Thompson**, Anaheim, Calif.

[73] Assignee: **University of So. Ca**, Los Angeles, Calif.

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[51] **Int. Cl.**[6] **H01L 35/24**

[52] **U.S. Cl.** **257/40**; 257/103; 313/502; 313/504

[58] **Field of Search** 257/40, 103; 313/502, 313/504

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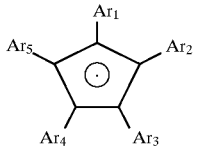
(List continued on next page.)

Primary Examiner—Sara W. Crane

Attorney, Agent, or Firm—Kenyon & Kenyon

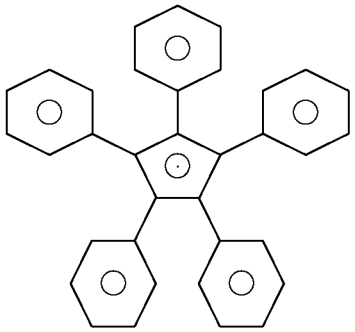
[57] **ABSTRACT**

Electron transporting layers comprised of organic free radicals are disclosed for use as the electron transporting layer in multi-layer structures that are useful for fabricating organic light emitting devices (OLEDs). For example, the multi-layer structure may include an electron transporting layer containing an organic free radical comprised of a multi-aryl-substituted cyclopentadienyl free radical of formula (I):



(I)

wherein Ar_1, Ar_2, Ar_3, Ar_4 and Ar_5 each are, independently of the other hydrogen, an alkyl group or an unsubstituted or substituted aromatic group. More specifically, included among these materials are those which are comprised of an electron transporting material based on, the pentaphenylcyclopentadienyl $Cp^{\Phi\cdot}$ free radical:



29 Claims, 1 Drawing Sheet